

# DESIGN

## ***Aspect One: defining the problem and selecting the variables.***

You will be given an open-ended problem to investigate

- There will be several independent variables – choose ONE
- Choose a dependent variable
- Consider all the relevant control variables

You must identify a focused problem or specific research question. You may do this by modifying the general aim (given) **and** indicating the variables you have chosen for investigation.

**Do not simply restate the research question.**

**INDEPENDENT VARIABLE** – the one factor that is manipulated that leads to the measurement of the dependent variable.

**DEPENDENT VARIABLE** – the one factor that is measured.

**CONTROLLED VARIABLES\*** – all factors being held constant so as not to obscure the effect of the independent variable on the dependent variable.

\*Relevant control variables are those that can reasonably be expected to affect the outcome. While there will be no penalty for control variables that are not immediately relevant you will be assessed only on the quality of the relevant controlled variables.

## ***Aspect Two: controlling variables***

Your method should include explicit reference to how the control of variables is achieved.

If controlling any variables is not practically possible, some effort should be made to monitor these variables.

A standard measurement technique may be used as part of the wider investigation but it should not be the focus. The assessment is on the individual design of the wider investigation.

If standard techniques are used they should be referenced. e.g. finding titration information in a literature source – a standard reference would be expected as a footnote.

You must decide on the equipment to use and the method you will follow.

### ***Aspect Three: developing a method for the collection of data***

The experimental design should anticipate the collection of sufficient data so the aim or research question can be addressed and an evaluation of the reliability of the data can be made.

“Sufficient relevant data” depends on context. e.g. if a trend line is to be plotted through a scattergraph then at least 5 data points are needed – so the plan should allow for repeated measurements to calculate a mean. In titrametric analysis the plan should show an appreciation of the need for a trial run and repeats until consistent results are obtained.

You decide how to collect data and how much to collect.